



INTERNATIONAL SCIENTIFIC CONFERENCE

SCIENCE EDUCATION TECHNOLOGY AND INNOVATION

SETI

BOOK OF PROCEEDINGS

BELGRADE OCTOBER, MCMXX





**IRASA**  
**International Scientific Conference**  
**SCIENCE, EDUCATION,**  
**TECHNOLOGY AND INNOVATION**  
**SETI II 2020**



**Book of Proceedings**

**IRASA -**  
**International Research Academy of**  
**Science and Art**

**Belgrade, October 2-3, 2020**



***Publisher***

IRASA – International Research Academy of Science and Art  
Belgrade

***For the Publisher***

Academician Prof. Vladica Ristić, PhD

***Editors***

Academician Prof. Vladica Ristić, PhD  
Academician Prof. Marija Maksin, PhD  
Academician Prof. Slobodanka Đolić, PhD  
Academician Prof. Gordana Dražić, PhD

***Reviewers***

Academician Prof. Vladica Ristić, PhD;  
Academician Prof. Slobodanka Đolić, PhD  
Academician Prof. Gordana Dražić, PhD  
Academician Prof. Jelena Bošković, PhD  
Academician Prof. Marija Maksin, PhD  
Academician Slavka Zeković, PhD  
Academician Prof. Mirko Smoljić, PhD  
Academician Prof. Slavko Vukša, PhD  
Academician Prof. Dragana Spasić, PhD  
Prof. Igor Jokanović, PhD

***Print run***

CD 150

***Printed by***

Instant system, Belgrade  
2020

ISBN

Publication of the Book of Abstracts has been co-financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia.



## Scientific Committee

- Academician Prof. Gordana Dražić, PhD, University Singidunum, Belgrade, Republic of Serbia, President of the Scientific Committee
- Academician Prof. Ibrahim Jusufrić, PhD, Rector, International University Travnik (IUT), Travnik, Bosnia and Hercegovina Federation
- Academician Prof. Yong Du, PhD, State Key Lab of Powder Metallurgy, Central South University Changsha, Hunan, People's Republic of China
- Academician Andy Watson, PhD, School of Process, Environmental and Materials Engineering, University of Leeds, UK
- Academician Prof. Juan Sanchez Monroe, PhD, Instituto Superior de Relaciones Internacionales "Raúl Roa Garcia", Universidad de La Habana, Republic of Cuba
- Academician Prof. Wolfgang Rohrbach, PhD PhD.habil, European Academy of Sciences and Arts, Salzburg, Austria
- Academician Prof. Tariq Javed, PhD, Chairman of the Department of Pathology, Faculty of Veterinary Science, University of Agriculture, Faisalabad, Islamic Republic of Pakistan
- Academician Prof. Alina-Mihaela Stoica, PhD, Director of the Department of Physical Education and Sport, University of Bucharest, Republic of Romania
- Prof. Božidar Mitrović, PhD, Head of the Department, Moscow University of Finance and Law, (MFUA), Moscow, Russian Federation
- Prof. Giancarlo Cotella, PhD, Interuniversity Department of Regional and Urban Studies and Planning, Politecnico di Torino, Republic of Italia
- Academician Prof. Miodrag Ivanović, PhD, Oaklands College, Associate College of the University of Hertfordshire, UK
- Academician Prof. Aleksandar Slaev, PhD, Department of Architecture and Urban Studies, Varna Free University "Chernorizets Hrabar", Varna, Republic of Bulgaria
- Academician Prof. Andrea Carolina Schvartz Peres, PhD, Faculty of Philosophy and Human Sciences, State University of Campinas, Federative Republic of Brazil
- Academician Prof. Mirko Smoljić, PhD, University „Sjever“, Varaždin, Republic of Croatia
- Academician Prof. Enes Huseinagić, PhD, International University Travnik (IUT), Travnik, Bosnia and Hercegovina Federation
- Prof. Atanas Kozarev, PhD, Faculty of Detectives and Criminology, European University, Skopje, Republic of Northern Macedonia
- Academician Prof. Vladica Ristić, PhD, Faculty of Applied Ecology Futura, University Metropolitan, Belgrade, Republic of Serbia
- Academician Prof. Marija Maksin, PhD, Institute of Architecture and Urban & Spatial Planning of Serbia, Belgrade, Republic of Serbia
- Academician Prof. Slobodanka Đolić, PhD, Slobomir P University, Bijeljina, Republic of Srpska



## SETI II 2020

### Book of Proceedings

- Academician Prof. Duško Minić, PhD, Department of Materials and Metallurgy, Institute of Chemistry, Technology and Metallurgy, University of Prishtina, Kosovska Mitrovica, Republic of Serbia
- Academician Prof. Jelena Bošković, PhD, Head of the Department of Engineering Management in Biotechnology, Faculty of Economics and Engineering Management, University Business Academy, Novi Sad, Republic of Serbia
- Academician Slavka Zeković, PhD, Scientific Advisor, Institute of Architecture and Urban & Spatial Planning of Serbia, Belgrade, Republic of Serbia
- Academician Prof. Dragana Spasić, PhD, Faculty of Philology, University of Prishtina, Kosovska Mitrovica, Republic of Serbia
- Academician Prof. Dragan Manasijević, PhD, Department of Metallurgy Engineering, Technical Faculty Bor, University of Belgrade, Republic of Serbia
- Academician Vladan Čosović, PhD, Scientific Advisor, Department of Materials and Metallurgy, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Belgrade, Republic of Serbia
- Nikola Krunić, PhD, Senior Research Associate, Institute of Architecture and Urban & Spatial Planning of Serbia, Belgrade, Republic of Serbia
- Marina Nenković-Riznić, PhD, Senior Research Associate, Institute of Architecture and Urban & Spatial Planning of Serbia, Belgrade, Republic of Serbia
- Academician Assistant Prof. Milena Premović, PhD, Department of Technological Engineering, Faculty of Technical sciences, University of Prishtina, Kosovska Mitrovica, Republic of Serbia
- Assistant Prof. Nikola Puvača, PhD, Faculty of Economics and Engineering Management, University Business Academy, Novi Sad, Republic of Serbia
- Assistant Prof. Ljubiša Balanović, PhD, Department of Metallurgy Engineering, Technical Faculty Bor, University of Belgrade, Republic of Serbia
- Dragana Vukašinić, PhD, Fauna Smart Technologies, Copenhagen, Kingdom of Denmark
- Jovan Rudež, PhD, Ministry of Internal Affairs of the Republic of Serbia, Sector for Emergency Situations, Belgrade, Republic of Serbia

## Organizing Committee

- Academician Mirza Totić, PhD
- MA Slobodan Milić, Candidate for Academician
- Academician Tatjana Živković, PhD
- Academician Ivana Jelić, PhD
- Academician Assistant Prof. Goran Filipić, PhD
- Academician Marija Bursać Mitrović, PhD, Research Associate
- MA Amit Vujić, Innovator of Academy
- Aleksandra Pavić Panić, PhD, Candidate for Academician



## TABLE OF CONTENT

### KEYNOTE PAPERS

Jelena Bošković	<b>GENETIC BASE OF PYRAMIDING STRATEGIES FOR DURABLE RESISTANCE TO LEAF RUST OF WHEAT.....</b>	<b>13</b>
Wolfgang Rohrbach	<b>MEDICAL TREATMENT AND CARE IN DIGITAL ERA.....</b>	<b>37</b>
Enes Huseinagić	<b>PREPARATION AND PLANNING OF EXPERT STAFF IS ONE OF THE MEANS OF SOLVING UNEMPLOYMENT.....</b>	<b>45</b>
Viliana Vasileva, Emil Vasilev, Gordana Dražić, Savo Vučković	<b>NEW TECHNOLOGIES IN FORAGE PRODUCTION AND ENVIRONMENT PROTECTION.....</b>	<b>53</b>
Vladica Ristić, Amit Vujić	<b>THE IOT SMART CITY TECHNOLOGY IN TRANSPORT SECURITY IMPROVEMENT.....</b>	<b>63</b>
Mirko Smoljić	<b>INTERNAL POLICY ASPECTS OF NATIONAL SECURITY.....</b>	<b>70</b>
Juan Sánchez Monroe, Dobrica Vesić	<b>THE INTERNATIONAL COOPERATION IN THE SUPPRESSION OF TERRORISM.....</b>	<b>82</b>

### A SCIENCE, TECHNOLOGY AND INNOVATION

Milena Premovic, Yong Du, Yuling Liu, Peng Deng, Huixin Liu	<b>KINETIC DATASET FOR THE CU-RICH FCC CU-AL-SN ALLOYS .....</b>	<b>95</b>
Milena Premovic, Yong Du, Duško Minić, Shuhong Liu, Tamara Holjevac Grguric	<b>THERMODYNAMIC DESCRIPTION OF THE TERNARY BI-NI-ZN SYSTEM.....</b>	<b>107</b>
Milena Premović, Milan Kolarević, Aleksandar Đorđević, Tao Xiaoma, Pavel Brož	<b>MECHANICAL AND ELECTRICAL PROPERTIES OF TERNARY CU-NI-ZN ALLOYS.....</b>	<b>119</b>
Milan Milosavljević, Aleksandar Đorđević, Duško Minić, Milena Premović, Dragan Manasijević	<b>EXPERIMENTAL INVESTIGATION OF THE TERNARY GE-IN-ZN.....</b>	<b>131</b>



Aleksandar Đorđević, Duško Minić, Milena Premović, Milica Tomović, Vladan Čosović	
<b>INVESTIGATION OF THE TERNARY GA-GE-ZN SYSTEM.....</b>	<b>142</b>
Ivana Jelić, Marija Šljivić-Ivanović, Slavko Dimović, Mihajlo Jović, Ivana Smičiklas	
<b>UTILIZATION OF CONSTRUCTION AND DEMOLITION WASTE.....</b>	<b>153</b>
Jovana Bošnjaković, Ivana Jelić, Velimir Komadinić	
<b>SUSTAINABLE ASPECTS OF BIOCOMPOSITE MATERIALS -     A REVIEW.....</b>	<b>165</b>
Sergej Vukša, Slavko Nešić	
<b>COMPOSITES AND INNOVATIVE MATERIALS IN     ARCTIC OFFSHORE CONDITIONS.....</b>	<b>172</b>
Vjekoslav Budimirović, Nebojša Budimirović	
<b>FUZZY VARIETIES.....</b>	<b>182</b>
Vladica Ristić, Milica Vukić, Jelena Bošković	
<b>THE IMPACT OF HAARP SYSTEM ON CLIMATE CHANGE AND     SUSTAINABLE AGRICULTURE.....</b>	<b>192</b>
Radivoj Prodanović, Maja Ćirić, Radovan Vladisavljević, Svetlana Ignjatijević	
<b>INTEGRATING ICT IN THE DEVELOPMENT OF COMPARATIVE     ADVANTAGES OF FOOD PRODUCTS.....</b>	<b>203</b>
Ljubica Šarčević-Todosijević, Aleksandar Stevanović, Jelena Bošković	
<b>MICROBIOLOGICAL CORRECTNESS - PRIORITY IN HEALTH     SAFE FOOD PRODUCTION.....</b>	<b>212</b>
Vlado Radić, Nikola Radić	
<b>DEVELOPMENT INDUSTRY 4.0 IN KNOWLEDGE ECONOMY.....</b>	<b>220</b>
Ana Globočnik Žunac, Ana-Mary Posavec, Vlatka Kordoš	
<b>CONFLICT MANAGEMENT TECHNIQUES IN BUSINESS     ORGANIZATIONS.....</b>	<b>232</b>
Branko Babić	
<b>WHAT HAPPENS TO AUTHORS OF INNOVATIONS THAT     COULD CHANGE THE WORLD AND WHO CONTROLS     NEW TECHNOLOGY.....</b>	<b>245</b>

## **B EDUCATION AND KNOWLEDGE FOR 21 CENTURY**

Božidar Trifunov Mitrović	
<b>TWO CIVILIZATIONS IN EUROPE.....</b>	<b>267</b>
Krsto Mijanović, Marko Jukić, Jefimija Mijanović- Jukić	
<b>EDUCATION FOR SUSTAINABLE DEVELOPMENT.....</b>	<b>288</b>
Marina Guzovski	
<b>THE INFLUENCE OF INFORMATION AND COMMUNICATION     TECHNOLOGY IN TEACHING ON MOTIVATION TO LEARN.....</b>	<b>296</b>
Murat Bilgin	
<b>EVALUATION OF INTERNATIONAL LAW EDUCATION IN     PERSPECTIVE OF ACADEMICIANS AND FIELD EXPERTS.....</b>	<b>304</b>





Slobodanka Đolić	<b>WORLD ENGLISH AND ITS REFLECTION TO EDUCATION IN SERBIA.....</b>	<b>311</b>
Dragana Spasić	<b>A WORD AS A LINGUISTIC UNIT.....</b>	<b>324</b>
Aleksandra Pavić Panić	<b>THE ROLE OF COMMUNITIES OF PRACTICE IN LANGUAGE AND GENDER RESEARCH.....</b>	<b>332</b>
Nataša Lukić	<b>ADVANTAGES AND DISADVANTAGES OF COMMUNICATIVE APPROACH AND GROUP WORK IN TEACHING ENGLISH AS A FOREIGN LANGUAGE.....</b>	<b>340</b>
Sabina Zejnelagić	<b>TECHNOLOGY AS A USEFUL TOOL IN A LANGUAGE ACQUIRING PROCESS.....</b>	<b>351</b>
Lidija Beko, Dragoslava Mićović, Nailje Malja Imami	<b>SUPPORTING THE DEVELOPMENT OF THEORY OF PRACTICE IN CLIL CLASSROOM IN HIGHER EDUCATION - A CASE STUDY OF FMG.....</b>	<b>360</b>
Ljubica Šarčević-Todosijević	<b>METHODICAL-DIDACTIC ANALYSIS OF A BIOLOGY TEACHING LESSON ON TOPIC "MUSHROOMS" IN AN OBSERVATIONAL CLASS.....</b>	<b>367</b>
Jelena Rajović, Marija Vuković	<b>THE IMPORTANCE OF NEEDS ANALYSIS IN ESP CURRICULUM DEVELOPMENT FOR VOCATIONAL SECONDARY SCHOOLS.....</b>	<b>374</b>
Marija Simić	<b>THE CHALLENGES OF CHILDREN AND YOUNG IN MUSIC EDUCATION.....</b>	<b>384</b>
Slobodan Milić	<b>THE INFLUENCE OF THE MASS MEDIA ON EDUCATION.....</b>	<b>393</b>

## **C PRESERVATION AND IMPROVEMENT OF ENVIRONMENT AND HEALTH**

Gordana Dražić, Nikola Dražić, Vuk Gajić	<b>NEW ECOTECHNOLOGIES FOR WASTE REUSE IN SUSTAINABLE HOSPITALITY.....</b>	<b>405</b>
Marija Šljivić-Ivanović, Ivana Jelić, Slavko Dimović, Mihajlo Jović, Ivana Smičiklas	<b>RADIOACTIVE SOIL CONTAMINATION AND REMEDIATION.....</b>	<b>414</b>
Marina Nenković-Riznić, Boško Josimović, Danijela Božanić	<b>SEA AS A CONTROLLING INSTRUMENT IN PREPARATION OF NATIONAL STRATEGIES IN SERBIA.....</b>	<b>423</b>
Jelena Mladenović, Vladica Ristić, Jelena Bošković	<b>THE MAGNIFICENT FIVE.....</b>	<b>433</b>





Ivana Plečić; Aleksandar Radenković, Marina Vuković	
<b>NEW TECHNOLOGIES FOR ENVIRONMENTAL PROTECTION - CONSTRUCTED WETLANDS IN THE ZASAVICA.....</b>	<b>441</b>
Dragan Bataveljić	
<b>GLOBAL CLIMATE CHANGES AND THEIR INFLUENCE ON THE ENVIRONMENT PRESERVATION AND HEALTH PROTECTION.....</b>	<b>453</b>
Boro Vujašin	
<b>HUMAN POPULATION ON THE BORDER OF OUR SURVIVAL.....</b>	<b>465</b>
Aleksandar Stevanović, Jelena Bošković, Ljubica Šarčević-Todosijević	
<b>THE IMPORTANCE OF ORGANIC PRODUCTION IN THE PROTECTION OF HUMAN HEALTH, BIODIVERSITY AND ENVIRONMENT.....</b>	<b>475</b>
Marina Nenković-Riznić, Borjan Brankov, Mila Pucar, Snežana Petrović	
<b>ESTABLISHING HOSPITALS` DISASTER RESILIENCE ON THE CASE OF HEALTHCARE INSTITUTIONS OF SMALL CAPACITY.....</b>	<b>483</b>
Nenad Bingulac	
<b>MISDEMEANOR PENAL POLICY FOR INDIVIDUALS BY LAW ON ENVIRONMENTAL PROTECTION.....</b>	<b>492</b>
Tanja Kvesić, Jelena Bošković	
<b>MONITORING OF WATER QUALITY PARAMETERS IN VOJVODINA.....</b>	<b>500</b>
Milica Vukić, Jelena Bošković, Vladica Ristić	
<b>REMOVAL OF ARSENIC FROM UNDERGROUND WATER AND DRINKING WATER USING ADSORPTION PROCESSES AND COMMERCIALY AVAILABLE ADSORBENTS.....</b>	<b>509</b>
Milutin Đuričić, Milan Đuričić, Zorana Nikitović	
<b>POSSIBILITIES OF PROTECTING THE ENVIRONMENT ON THE EXAMPLE OF REDUCING AIR POLLUTION IN THE CENTRAL ZONE OF THE CITY OF UZICE.....</b>	<b>520</b>

## **D GOVERNANCE AND SUSTAINABLE TERRITORIAL DEVELOPMENT**

Vladica Ristić, Marija Maksin	
<b>STRATEGIC PLANNING OF SUSTAINABLE URBAN DEVELOPMENT IN SERBIA.....</b>	<b>535</b>
Slavka Zeković	
<b>A PROPAEDEUTICS IN SERBIA'S NEW INDUSTRIAL POLICY AND ITS IMPACTS ON TERRITORIAL DEVELOPMENT.....</b>	<b>549</b>
Jasmin Latović	
<b>THE EUROPEAN UNION AND BREXIT DEAL WITH THE UNITED KINGDOM FROM A LEGAL POINT OF VIEW.....</b>	<b>563</b>



Milan Gligorijević, Aleksandar Maksimović	
<b>ROLE AND IMPORTANCE OF INFORMATION SECURITY SYSTEM IMPLEMENTATION IN THE REALIZATION OF THE "SMART CITY" CONCEPT.....</b>	<b>567</b>
Igor Jokanović	
<b>IMPROVED MOBILITY FOR SUSTAINABLE DEVELOPMENT.....</b>	<b>576</b>
Boryana Nozharova, Peter Nikolov	
<b>HUMAN SCALE AND PEDESTRIAN CONNECTIVITY BETWEEN PUBLIC SPACES.....</b>	<b>597</b>
Jovan Rudež, Nebojša Pavlović, Vladan Petrović	
<b>ECONOMIC EFFECTIVENESS OF LOCAL PLANNING AND DECISION-MAKING SYSTEM IN PUBLIC PROCUREMENT PROCESS.....</b>	<b>608</b>

## **E NATIONAL SECURITY AND PROTECTION**

Slavko Vukša, Tatjana Živković	
<b>NATIONAL SECURITY IN THE WORLD OF GLOBALIZATION.....</b>	<b>623</b>
Tatjana Gerginova	
<b>COMPONENTS OF NATIONAL SECURITY.....</b>	<b>632</b>
Olgica Vulević, Slaviša Đukanović, Milan Gligorijević	
<b>INTEGRAL NATIONAL SECURITY AND ORGANIZED CRIME.....</b>	<b>641</b>
Nikola Radić, Vlado Radić	
<b>FOREIGN DIRECT INVESTMENTS IN SERBIA'S DEFENSE INDUSTRY AND NATIONAL SECURITY.....</b>	<b>651</b>





## SETI II 2020

### Book of Proceedings

- typology, *European Planning Studies*, 2020, Published online 10 Feb 2020, DOI: 10.1080/09654313.2020.1726295, accessed 15 February 2020.
- [14] *New Urban Agenda*, Adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Quito, Ecuador, on 20th October 2016. Retrieved from: <https://www2.habitat3.org/> accessed 15 February 2020.
- [15] *Transforming our World: The 2030 Agenda for Sustainable Development*, United Nations, 2015, A/RES/70/1, Retrieved from: [https://sustainabledevelopment.un.org/content/documents/21252030\\_Agenda\\_for\\_Sustainable\\_Development\\_web.pdf](https://sustainabledevelopment.un.org/content/documents/21252030_Agenda_for_Sustainable_Development_web.pdf), accessed 15 February 2020.
- [16] *Leipzig Charter on Sustainable European Cities*, European ministers responsible for urban policy, 2007, Retrieved from: [https://ec.europa.eu/regional\\_policy/archive/themes/urban/leipzig\\_charter.pdf](https://ec.europa.eu/regional_policy/archive/themes/urban/leipzig_charter.pdf), accessed 15 February 2020.
- [17] *The Urban Agenda for the EU - Multi-level governance in Action*, Regional and Urban Policy, European commission, 2019, [https://ec.europa.eu/regional\\_policy/sources/docgener/brochure/urban\\_agenda\\_eu\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/brochure/urban_agenda_eu_en.pdf), accessed 15 February 2020.
- [18] *Global State of National Urban Policy*, UN-HABITAT/OECD, Nairobi, 2018
- [19] Pahl-Weber, E., Henckel, D. *The Planning System and Planning Terms in Germany*, Studies in spatial development, Academy for Spatial Research and Planning, Hanover, 2008
- [20] *Urban Development Concept Berlin 2030*, Senatsverwaltung für Stadtentwicklung und Wohnen Berlin, Stadt Berlin, 2015
- [21] *Integrated Urban Development Concept Leipzig 2030*, Stadtplanungsamt, Stadt Leipzig, 2018
- [22] *Sustainable Urban Development Strategy of the Republic of Serbia until 2030*, Official Gazette, 47, 2019 (in Serbian)



## **A PROPAEDEUTICS OF SERBIA'S NEW INDUSTRIAL POLICY AND ITS IMPACT ON TERRITORIAL DEVELOPMENT**

*Slavka Zeković<sup>42</sup>*

### **Abstract**

The paper analyzes the post-socialist industrial development of Serbia and the theoretical and empirical propaedeutics on new industrial policy (under the influence of the EU industrial policy, globalization process and the Fourth Industrial Revolution/4IR). It is indicated the key issues of Serbian industry, explored the strategic perspectives of a new industrial policy of Serbia, and its possible impacts on territorial development. An analytical framework of the globalization theory regarding a new industrial policy has been applied in the paper, as well as the European RIS framework, which was prescribed for the EU accession countries, in preparation of their "Strategy of Smart Specialization"/S3. The paper has indicated global challenges of the new industrial policy under disruptive technological changes, uncertain growth and precarious employment. The global framework for a new industrial policy causes a new spatial configuration, especially in the regions and cities, such as a new production platforms and diffusion of new work-spaces. It indicates a new shift of the possible implications of 4IR and industrial policy to the territorial planning and governance. The real opportunities for the Serbian industrial policy are given in the paper as well as some recommendations for its improvement.

*Key words: New industrial policy, Research and Innovation Systems/RIS, Smart Specialization Strategy/S3, Fourth Industrial Revolution/4IR, territorial impacts, Serbia*

### **Introduction**

The global economic and financial crisis has highlighted long-standing structural weaknesses in the depletion of the industrial base, in globalization and sustainability [1]. After the global economic recession, it was clear that a departure from the post-Fordist concept of economy, which is based on the domination of the service sector and programmed de-industrialization of the states, was necessary. There has been renewed interest in a stronger recovery and a new industrial strategy. The main reason for this are the risks observed during the crisis due to "excessive" market liberalization and the "volatility" of financial services [2]. Countries with a larger share of industry in their GDP have been shown to be less affected by the crisis. De-industrialization of the EU took place in conditions of weak economic growth,

---

<sup>42</sup>Slavka Zeković, PhD, Scientific adviser, Academician of IRASA, Institute of architecture and urban & spatial planning of Serbia, Belgrade, Republic of Serbia, zeksmbv@eunet.rs





decrease in the gross value added (GVA) of industries, increase in productivity and industrial production [3]. The steady increase in employment in the EU has been accompanied by a declining industrial employment. Overall trends indicate a risk of further decline in the GVA of industry and its share in the total employment of the EU. This is why the EU has opted for the "European Industrial Renaissance" as a top priority, which means that without investment in innovation, technology, knowledge and production, there is neither new value nor social well-being. Slow economic growth, the failure of industrial policy (IP) across Europe, the need for a stronger recovery from the post-crisis industry, the digitalization of the economy, and the emergence of Industry 4.0 indicate a sense of urgency for creating a new IP. Economic growth in the EU is particularly weak, and the real GDP has surpassed the pre-crisis level only in 2016 [4]. Although industry generates 16% of GDP, its importance is much greater given that it generates over 75% of exports and 25% of jobs [4]. This opens up challenges due to the insufficiently researched effects of the development of new technology on employment, labor market, social and structural changes and regional balance. A new EU industrial strategy is becoming a driver of economic growth and recovery and a major mean for reducing competitiveness gaps [5]. This is why the EU is creating the conditions for re-industrialization. A key step is linking them to the priorities and objectives specified in the *Europe 2020 Strategy*[6]. At theoretical level, it is implied that, after the regression and deindustrialization phase, a progressive reintegration and renewal phase can be expected.

The paper discusses the global theoretical framework and the new European approach to the IP, the post-socialist industrial development of Serbia, the perspectives and recommendations for a new IP in Serbia and its possible implications.

## **Theoretical framework of industrial policy**

The IP means a set of policies that aims to encourage structural changes, i.e. not exclusively "horizontal" changes [7]. The classical IP is closely related to import-substitution industries, emerging industries, the development of "state industrial champions" (Benner, 2019) and protectionism. Criticism of these IPs refers to failures in the selection of "champions", possible repression on private investment [7], implementation of "secret practices between political and economic powers" [8], and selective interventions.

A combination of IPs, selective openness to trade and investment, and macroeconomic stability are more conducive to industrialization than pure market liberalization [9]. One of the most influential policies in the new generation of the IP is based on clusters and on the systematic promotion of certain industries. Unlike classic IPs, the new generation of IPs does not strive to restrict competition, but relies on market advantages and a knowledge-based economy. This is why IP is increasingly linked to the innovation and entrepreneurship policy [10, 11], with the strengthening of the state's "entrepreneurial" role in innovations and driving structural changes.



The *Europe 2020 Strategy* has initiated a new IP trend at EU level with the aim of smart, sustainable and inclusive growth. Under the auspices of the document, the European Commission has launched the "flagship initiatives": the Digital Agenda [12], the EU's Integrated Industrial Policy [13] and the "Innovation Union" [14]. According to the document *For a European Industrial Renaissance* [15], the purpose of creating a new IP of EU is to foster industrial growth, competitiveness and employment, sustainable and inclusive growth, with the strengthening of the institutional framework and policy instruments. The aim of the new IP is the creation of better opportunities for international cooperation, networking, knowledge transfer, strengthening entrepreneurial skills and technological capabilities towards *Europe 2020* [6] through a partnership between governments and the industry.

Over the last decade, there has been a change in the understanding of IP and regional policy in the EU. This includes abandoning the traditional neoclassical approach (often spatially undefined) and an orientation to the place-based approach and European framework of Research and Innovation Strategies for Smart Specialization (RIS3) with a focus on developing knowledge and innovation to raise regional strengths. RIS3 is a key component in *Europe 2020* [6] and its *Cohesion Policy till 2020*.

The European Commission has announced a new industrial strategy which summarizes the innovation policy, digitalization and the "green" economy with the aim of supporting smart, inclusive and sustainable growth by the implementation of RIS3 [5]. The EU countries had to develop frameworks for Strategies for Smart Specialization (S3) because of access to co-financing till 2020. This conditionality shows that S3 has become a backbone of cohesion policy, i.e. its relevance to regional development is obvious. Due to its focus on structural changes, the RIS3 qualifies as an EU industrial policy [16]. The first framework of IP is the S3 approach, especially in the underdeveloped regions of Europe, whose procedural side reflects the basic principles of the new IP, because it supports the institutional preconditions for experimentation and "self-discovery" [17, 18]. The second framework for the IP of EU is the Horizon 2020 research and innovation program, with priorities for funding research projects and new technologies, as well as the promotion of innovation, especially in SMEs. A comparison of S3 and Horizon 2020 shows that both concepts follow different, but complementary elements. While the approach S3 follows territorial logic and focuses on endogenous development of the region, the Horizon is characterized by the spatially "blind/ed" development logic. Both frameworks indicate experimentation, "self-discovery" and public entrepreneurial investment to reduce the risk of private investment.

The slow recovery of European industry after the recession has shown that it is difficult to achieve economic growth without targeted interventions for the starting of industries [8]. That is why the industrial strategy encompasses a set of measures that the state is taking for improving the performances of industrial companies, sectors and clusters [19]. These measures include support for the new IP, science, technology, innovations, human capital, public procurement, de-regulation, antitrust policy, FDI, intellectual property rights, the allocation of financial resources and the development of regional product clusters [20].





The new IPs include the role of an "entrepreneurial state" and urge authorities to take a catalytic and facilitative role in innovation and economic growth. The S3 is a place-based approach, which advocates for the policy interventions to support specific "experiments" and activities across the region, and harness the potentials for innovation, knowledge transfer and their commercial use.

Underdeveloped regions are usually characterized by lower potential in terms of entrepreneurial talent, work skills and technological capacities, as a basis for the development of new specializations. New value creation activities take place in the "bottom-up" entrepreneurship discovery process [21] and develop on the existing regional resources that facilitate new regional specializations. The regional policy, based on a place-based approach, identifies sectors and areas, and encourages the local innovation in specific areas [22]. Doloreux [23] points to several types of RISs: 1) the organizationally weak RIS (lack of actors), 2) fragmented RIS (lack of regional cooperation), and 3) "locked" RIS (immanent to the old industrial regions).

Regional actors should identify the capabilities and strengths that exist in the region in the collective process of the entrepreneurial discovery [24]. Radosevic [16] considers the main challenges for the "Western Balkans" to be the lack of levers for growth, a focus on technology imports, and industrial lagging. However, Serbia is characterized by a relatively advanced research of technological development. The implementation of S3 is limited by weak institutional capacities, especially in underdeveloped regions.

### **A new industrial policy of the European Union**

The European development is in a critical position because of weak economic and industrial growth, and it is faced with major socio-economic and sustainability challenges [25]. The consequences of the global crisis are growing socio-economic inequalities, especially in the lagging regions [26]. De-industrialization has hit most of the European countries even before the global crisis [27]. The impact of the crisis is reflected in the loss of 20 million jobs in industry (2007-2016) as well as in the decrease of production and competitiveness [4].

Some researchers indicate that production processes and innovations are closely related and they benefit from co-location synergistic effects [28], i.e. creating and retaining a new value in the "same location" contributes to sustainable regional growth [29].

The EU has initiated "industrial renewal" to overcome structural weaknesses [30, 19] and to restore industrial competitiveness with the aim of increasing the industrial share in the GDP to 20% by 2020. Re-industrialization involves an innovative, "green", technologically advanced industry that supports over 23 million SMEs. The framework for re-industrialization involves access to finance, capital, markets, training, and greater investment in innovation.

The new industrial strategy should respond to numerous challenges and objectives such as: acceleration of industrial growth; inclusive and sustainable socio-economic growth; structural weaknesses; increasing competitiveness; the creation of a new value in order to achieve sustainable growth; digitalization of economy and industry; raising the innovation level and investment in new technologies; better



coordination of the industrial, regional and other policies; access to industrial inputs; the creation of entrepreneurial skills; education, etc.

The new IP involves the changing of the production within 4IR: abandoning the concept of "economies of scale" with the support of production towards an "economy of small series of quality products"; respect for individual customer preferences ("mass personalization of products"); and digitalization. New value chains in the industry are being realized through digital infrastructure: vertical distribution networks, the integration of production and services; horizontal distribution networks of suppliers, manufacturers and customers.

Technologies of 4IR and digitalization are transforming the industrial structures, opening up new issues of competition policy, education, training, governance and regulation [31]. The IP needs to better coordinate the development of technologies, sectors and locations, in the process of employment and competition by applying the principles of sustainability and circular economy [32]. Place-based IP is a powerful tool for territorial cohesion.

Mazzucato [33] points to the complex nature of innovation that requires from the states to promote "mission orientation", research and innovation, and to focus on *bottom-up* and "self-discovery" experimentation. The entrepreneurial state as a support to the new IP encompasses: a) a facilitating catalytic role in supporting innovation; b) a portfolio approach based on triggering structural changes; and c) assuming the risk of failure innovation projects and the risk of experimentation by the public sector, which allows for commercial private investment [10].

There are significant regional differences in the growth of territorial innovation in the EU. The productivity gap has deepened between firms, sectors and countries, due to insufficient diffusion of technologies and innovations [34] and insufficient entrepreneurial capital [35].

The support of the new IP implies harmonizing the development challenges of the existing EU industrial and cohesion policy (2014-2020) with the *Europe 2020 Strategy*, the *European Research and Innovation Program*, the program *COSME* (SMEs support) and *Horizon 2021-2027* (EC, 2017). The prospects for the future innovation-oriented IP after 2020 are based on *Horizon 2021-2027*, which includes the scientific excellence, global challenges and the European industrial competitiveness.

The main innovations in *Horizon 2021-2027* are: a) the introduction of a European Innovation Council, as a *one-stop-shop*, which will support innovation, encourage private finance and start-ups; b) research, development and missions, i.e. mission-oriented development, and involving the public, private and civil sectors to meet the needs of society and citizens [36]; c) the strengthening of international cooperation; d) open science policy; e) a new approach to partnership through co-programmed, co-financed institutionalized partnerships, with wide stakeholder participation based on five identified mission areas.

## Industrial development in Serbia

The main characteristic of industrial development in Serbia since the 1990s has been a drastic decline in production (especially in the period of hyperinflation 1992-1993) and a strong process of de-industrialization, which implies a decrease in the





industry's share in the GDP, GVA and total employment [3]. This was mostly due to non-economic reasons, such as civil wars, the dissolution of the SFRY, UN sanctions (1992), the bombing (1999), and so on. These causes have contributed to a GDP decline of over 50% [3].

In the 1990s, under the neoliberal agenda and the Washington Agreement, the post-socialist transition started. It has included: 1) transformation from socialist self-governance economy into the market (Post-Fordist) economy; 2) privatization of assets (> 30% of unsuccessful sales of earlier state/socially-owned enterprises); 3) strong de-industrialization, with one million jobs lost (600,000 in industry) and a huge "brain drain". During the period between 1990 and 2018, there was very divergent economic growth, such as: a) *the collapse of economy and transitional recession* with a negative GDP growth (-6.3% from 1991 to 2000), and b) *slow recovery after 2000 until the present with different dynamics of economic growth*. Since 2000 till now, there have been three phases characterized by: 1) *fast GDP growth (average 5.4%)* with a slow recovery and restructuring of real economy (2001-2008); 2) a *slowdown* in economic growth from the 2008 crisis till 2015 with an average GDP growth of 0.6% (also - 6% in 2009) with economic stagnation; and 3) a *weak recovery* of economic growth from 2016 to 2018, with a GDP growth of 2.8%, 2%, 3.5% respectively (Figure 1).

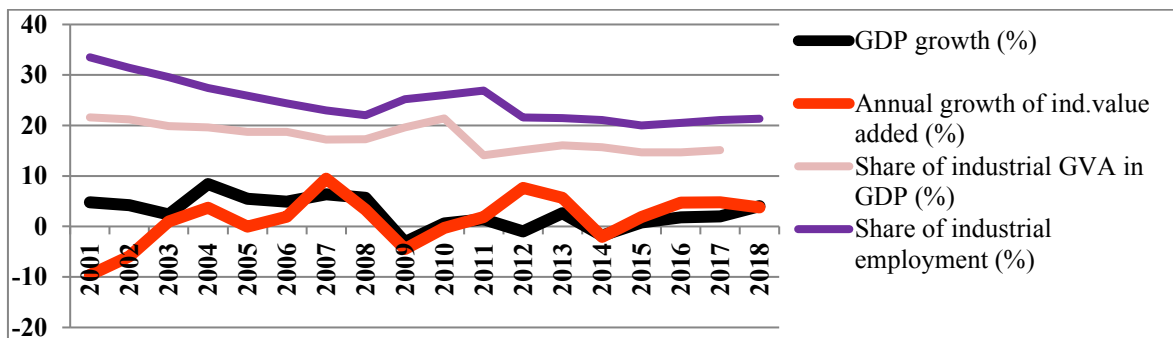


Figure 1: Indicators of Serbian industry (in %) Source: Statistical Yearbook of Serbia (2002-2018)

This period lacked the restructuring of public enterprises and large industrial enterprises in Serbia, with a slow-down in transition. The trend of economic recovery and initial re-industrialization started after 2015, with a GDP growth of 1.9%, 3.3%, 2% and 4.4%, respectively, and 3.5% in 2019 [37]. During this period, the dynamics of industrial growth was above average (4.4% per year), with an average total of GDP growth of 2.9%. A slight recovery has been indicated by an increase of total and industrial employment at an average rate of 4.8% per year [38]. The industrial share in the total employment increased from 20% in 2014 to 21.8% in 2018, owing to the rise of FDI. Production of a low technological level is allocated to Serbia, which requires mostly low-skilled labour.

### The prospects of Serbia's new industrial policy

The *Strategy and Policy of Industrial Development of the Republic of Serbia from 2011 to 2020* [39] and the *Action Plan for its Implementation* [40] based on the *Post-Crisis Model*



of *Economic Growth and Development of Serbia from 2011-2020* [41] have predicted reindustrialization. So far, the projections of economic growth ( average real GDP growth of 6%, manufacturing GDP growth of 7.3%, increase of employees for 400,000 workers, productivity and competitiveness growth, double of export share in the GDP, and high investment growth) have not been realized. The IP of Serbia [39] has been sporadically implemented with a focus on restructuring and regional development. It is the first development document that defines in a consistent manner the need for re-industrialization, the export orientation of the industry, the priorities of the Serbian industry and the ways of achieving them. The Strategy is in line with the *Europe 2020 Strategy*. Industrial changes should take place in three stages: 1) revitalization and renovation; 2) restructuring (technological modernization); and 3) increasing its competitiveness by moving from a predominantly low-tech structure to a high-tech one, as the most difficult goal to achieve, because Serbia is one of the least developed European countries. It is about changing the overall development paradigm, from the traditional approach based on the exploitation of natural resources - towards a development based on new technologies, innovations, education, cooperation, partnerships and competitiveness for creating a high GVA. A classical IP was based on the identification of priority branches, production and support for development through various forms of direct and indirect subsidies (e.g. grants or cheap loans, incentives, state aid), and on direct control managed by state institutions.

Serbia and South-East European countries have adopted a common *Strategy SEE 2020* [42] with a "mainstream economy" focus on digitalization and high technology in the service sectors, without planning their industrial development.

In the next few years, Serbia's GDP is projected to grow 3-4% annually. Although respectable, this growth rate is below Serbia's development needs, bearing in mind the need to catch up with the transition and developed countries. *Serbia's new growth agenda* [43], prepared by the World Bank, has forecasted Serbian real GDP growth up to an incredible 7% annually over the next 20 years, as well as the generation of 100,000 jobs per year [43, 44]. The new IP should be based on realistic goals, development capabilities, limited technological capacities and available industrial capabilities for applying the innovations. The IP should enable the solutions for key development, economic and social problems in Serbia.

According to the *Draft Strategy of IP Serbia 2021-2030* [45], the main aim is increasing Serbia's competitiveness with the following specific goals: raising the technological level of the industry and its transformation towards digitalization and automation; increasing the contribution of research and innovation solutions to the development and digitalization of industry; increasing investments with a balance in their structure and quality; increasing the level of the value added in industrial export, and the transformation of the industry from a linear to a circular model with a reduction in CO<sub>2</sub> emissions. The main interventions are envisaged: human resources empowerment for industrial development, digital transformation of industry, innovation, investment, and internationalization.

The new IP of Serbia should incorporate the frameworks and solutions of the *Draft on Smart Specialization Strategy of Serbia/S3* [46]. The goal of RIS3 in Serbia is development and placement of top innovative products and services on the global





market. In developing S3 Serbia, the framework of the Joint Research Centre for Smart Specialization in the countries covered by the EU enlargement process and neighbouring EU countries, adopted by the European Union in 2018 (as binding), was applied. Adoption of the S3 is expected in 2020, and it is one of the conditions for closing Chapter 20: Entrepreneurship and IP in the EU accession process. The *Draft of S3 in Serbia* [46] envisages the development of four vertical priority areas: 1) *ICT* (Big data, cloud technology); IoT; software); 2) *Creative industries* (Creative digital media production and services; gaming industry; smart and active packaging); 3) *Food for futures*(high-tech agriculture; value added food products; sustainable agri-food production); 4) *Future machines and manufacturing systems*(application machines; data to decision-Industry 4.0; premium tools and smart mobility solutions; sustainable heat appliances and devices; solutions for smart ecosystems; 5) *Energy efficient and eco-smart solutions*; 6) *Key enabling technologies and emerging technologies*(photonics; advanced materials and manufacturing technologies; electronics); industrial biotechnology; block-chain technologies; autonomous driving, aerospace systems and engineering).

Within the horizontal dimension, two priority areas are envisaged: *energy efficient and eco-smart solutions*, and *key technologies and emerging technologies* (photonics; advanced materials; manufacturing technologies; electronics; biotechnology; *block-chain* technologies; automatic control, etc.).

Bearing in mind the existing documents for the industrial development in Serbia, herein, two additional aims of the new IP are suggested as follows: a) strengthening the horizontal initiative at territorial level to improve regional competitiveness through various interventions; and b) overcoming the challenges and uncertainties in the implementation of IP regarding the dynamics of industrial growth and its possible implications, also depending on the choice of the ultra-liberal or ultra-societal approaches or some hybrids.

## **Recommendations for a new Serbian industrial policy**

The new IP should enable a shift towards increased competitiveness and the innovatively based competitiveness. Serbia should adjust the IP to the new European IP, although it has very limited access to most of the financial, human, institutional and other resources that are necessary for industrial development, especially high-tech industries. The development of new technologies is expensive and demanding, while the expectation of significant effects can be achieved only in the long-term. The key issues of the sector priorities of the new IP have not yet been resolved [47-49]. The real possibilities for the new IP are extremely modest, especially because of Serbia's low level of development. Serbia is focused on importing modest and the lowest levels of technology mainly through FDI. The scope for defining a new industrial development is extremely narrow, especially after the global crisis, in terms of institutional and financial capacity, and human resources. In the new IP, there is a real limited application of the locally adapted concept of re-industrialization, i.e. the process of export-driven re-industrialization as a locally adapted 'resilient' concept of the IP in accordance with RIS3 and 4IR frameworks; limited establishment of horizontal (regional) production platforms and clusters



(innovative networking of companies and other agents); more investments in research, education, capacity building; changes in the legal, financial and organizational framework; better coordination of public policies with strategic decision-making, planning and governance.

The new IP should include the global framework of 4IR: an almost complete change to the concept of production and governance (due to the speed, complexity and transformative power of Industry 4.0); abandoning the concept of "economies of scale" with respecting the market preferences of customers; digitalization; and the establishment of regional production platforms (physical and informational).

The key features of 4IR are exponential growth, competitiveness, rapid changes and social, economic and financial uncertainties. The 4IR imperatively involves increasing the intensity of knowledge in the creation of new values in an economy based on innovations; sophisticated and innovative products; services; "smart" industrial enterprises; digital networking and integration; "computer-generated" products, and the complex effects of new technologies. However, the reality in the industrial structure of Serbia today is completely different. The global challenges of Industry 4.0 are initiating an increase in the share of precarious work, transformation of social standards, with the reduction of jobs for low-skilled and non-digital workers.

### **Possible implications of the industrial policy**

Strategic determinants of the future Serbian IP should bring different novelties that can implicate numerous effects on spatial processes and structures, such as: 1) support to the process of selective export-based re-industrialization in line with RIS3 (with local innovative products with a higher GVA); 2) implementation of the global 4IR framework as well as some degree of de-globalization; 3) establishment of horizontal (regional) production platforms; 4) customized mission-oriented industrial innovation; 5) the role of an "entrepreneurial" state that initiates investment in research and innovation and assumes all innovation risks because of the innovation-driven growth, but with a socio-spatial balance.

The application of 4IR technologies can bring deep and rapid social changes, changes in all economic sectors as well as in the business environment; "disruptions" on the labor market and in employment (automation replacement of labour, rapid changes of qualifications, job creation for highly qualified workers in the fields of new technologies, a lack of highly skilled workforce); changes in the education system, to product quality, to everyday life, and changes in the financial system. The economic effects and socio-spatial impacts are still unexplored, unpredictable and uncertain. The IP should avoid dichotomies (technological development vs. jobs; growth or equity).

It is estimated that the IP based on 4IR could contribute to an increase in socio-economic inequalities and the division between precarious and privileged actors by raising the share of precarious labor; the reduction of jobs and the replacement of low-skilled jobs by digitization and automation. The implementation of the framework 4IR could lead to profound social changes, transformation of social standards and greater social tensions. The 4IR technologies could significantly affect



the people's lives, such as their quality of life, business environment, employment, consumer expectations, product quality, various actors, and organizational, urban and social innovations. The development of new industrial technologies highlights the need for a major transformation in the educational system - in learning, skills and knowledge, as well as in the integration of strategic, critical and ethical thinking in the use of 4IR technologies.

Significant impacts of the concept of industrial development at all territorial levels can be expected from new production and investment platforms. Industry 4.0 can cause "dramatic" regional GDP growth or industrial de-growth, the so-called "sacrificing" economic growth and possible jobless growth [50].

The key issue is uneven territorial industrial development in order to achieve a balance between the two basic spatial types of industrial development in Serbia [51, 52, 53]: the concept of competitive spatial distribution of industry and the concept of cohesive spatial distribution. So far, the spatial concentration and polarization of industrial development have dominated, especially in the metropolitan areas of Belgrade and Novi Sad, and in certain areas in corridors VII and X.

## Conclusion

Transitional changes and the great economic recession after the global crisis have highlighted the long-standing structural weaknesses related to the shrinking of Serbia's industrial base. After the transition recession and the global crisis, the strengthening of the process of reindustrialization began. Despite the "toxic" reduction of the industry's share in the GDP from 44.5% to 14.5% in the period between 1989 and 2018, it will still remain one of the most important economic sectors in Serbia in the future. This involves a new IP of Serbia with the aim of solving one part of the development problems and the harmonization of the real possibilities of industrial development with the global framework of 4IR, especially with the new European IP and RIS3.

Serbia has not yet prepared the "exit strategy" (Serbia adopted the following: *Strategy of scientific and technological development of Serbia 2016-2020*; *Strategy of industrial development of Serbia 2011-2020*; *Spatial Plan of Republic of Serbia 2020*; *Development plan of Serbia 2025*) while RIS4 is not yet completed. In Serbia, extremely limited real opportunities are evident for the perspectival intelligence-smart thinking about the future smart industry in an underdeveloped country (e.g. narrow manoeuvre abilities, resources, capacities etc.). There is a conundrum how Serbia as an underdeveloped country can achieve fast growth in the global race among 4IR industries. Serbia is a "follower" regarding the import of modest and the lowest technologies. Development prospects for S4 are very limited and gloomy. The *Draft S3 of Serbia* promotes prioritization and vertical selection instead of neutral and horizontal programs; decentralization, self-discovery and flexibility; transformative activities rather than sector priorities. In the establishment of a new IP, what is very important are the principles for determining priorities in the prioritization process (e.g. entrepreneurial discovery, experimentation, spillover of development effects) as well as the IP socio-territorial implications.





## Acknowledgements

The paper is a result of research financed by the Ministry of Education, Science and Technological Development of Serbia.

## References

- [1] EC (2012) Mission Growth: Europe at the Lead of the New Industrial Revolution. Enterprise and Industry [http://ec.europa.eu/enterprise/initiatives/mission-growth/index\\_en.htm](http://ec.europa.eu/enterprise/initiatives/mission-growth/index_en.htm)
- [2] Page, T., A European industrial policy for the new global economy, *Internomics*, 50, 2015, pp.152-55.
- [3] Hadžić, M. & Zeković, S., Rethinking deindustrialization, and the reindustrialization policy in Serbia, *Spatium*, 41, 2019, pp.14-22.
- [4] Eurostat, European Statistics. European Commission, 2016.
- [5] EC/European Commission, Investing in a Smart, Innovative and Sustainable Industry: A Renewed EU Industrial Policy Strategy, Brussels: Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of Regions and the European Investment Bank, September 13, 2017.
- [6] Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth. EC/European Commission, Brussels: Communication from the Commission, March 3, 2010.
- [7] Landesmann, M., Industrial policy: Its role in the European economy, *Internomics*, 50, 2015, pp.133-138.
- [8] Pianta, M., What is to be produced? The case for industrial policy, *Internomics*, 50, 2015, pp.139-145.
- [9] Benner, M., Industrial Policy in the EU and Its Neighbourhood: Learning from Policy Experimentation, *Economies*, 7(2), 2019, pp.44.
- [10] Mazzucato, M., The entrepreneurial state, *Soundings*, 49, 2011, pp.131-142.
- [11] Mazzucato, M., Which industrial policy does Europe need? *Internomics*, 50, 2015, pp.120-125.
- [12] EC/European Commission, A Digital Agenda for Europe. Brussels: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, August 19, 2010.
- [13] EC/European Commission, An Integrated Industrial Policy for the Globalisation Era: Putting Competitiveness and Sustainability at Centre Stage. Brussels: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, October 28, 2010.
- [14] EC/European Commission, Europe 2020 Flagship Initiative: Innovation Union. Brussels: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions, October 6, 2010.



- [15] For a European Industrial Renaissance, European Commission, 2014, [https://ec.europa.eu/growth/industry/policy/renaissance\\_en](https://ec.europa.eu/growth/industry/policy/renaissance_en)
- [16] Radosevic, S., Assessing EU smart specialization policy in a comparative perspective. In *Advances in the Theory and Practice of Smart Specialization* (Eds. S. Radosevic, A. Curaj, R. Gheorgiu, R. Andreescu and I. Wage. London: Elsevier, 2017, pp.2–37.
- [17] Benner, M., Smart specialization and institutional context: Towards a process of institutional discovery and change. *Papers in Economic Geographical Innovation Studies*, 3, 2018.
- [18] Kroll, H., Efforts to implement smart specialization in practice—Leading unlike horses to the water. *European Planning Studies*, 23, 2015, pp.2079–2098.
- [19] Pitelis, C., DIP-ly Speaking: Debunking ten myths, and a Business Strategy-Informed Developmental Industrial Policy, in D. Bailey et.al (eds.) *New Perspectives on Industrial Policy for a Modern Britain*, OUP, 2015.
- [20] Cimoli, M., Dosi, G. & Stiglitz, J.E., The rationale for industrial and innovation policy, *Internomics*, 50, 2015, pp.126–132.
- [21] Foray, D., In response to ‘Six critical questions about smart specialisation’, *European Planning Studies*, 27(10), 2019, pp.2066-2078.
- [22] Camagni, R. & Capello, R., Regional innovation patterns and the EU regional policy reform: Toward smart innovation policies, *Growth and Change*, 44, 2013, pp.355–389.
- [23] Doloreux, D., What we should know about regional systems of innovation, *Technology in Society*, 24, 2002, pp.243-263.
- [24] Foray, D., Paul, A. David, & Hall, B., *Smart Specialization—The Concept*. Knowledge Economists Policy Brief No. 9, Brussels: European Commission, 2009.
- [25] European Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, 2014.
- [26] Rodriguez-Pose, A., The revenge of the places that don't matter (and what to do about it), *Cambridge Journal of Regions, Economy and Society*, 11,1, 2018, pp.189–209.
- [27] Savić, Lj. & Zeković, S., *Industrijska politika EU-pouke za zemlje u tranziciji, u Strateški okvir za održivi razvoj Srbije*, Beograd: IAUS, Posebna izdanja, br.44, 2004, str.57-68.
- [28] Ketovivi, M. & Ali-Yrkkö, J., Unbundling R&D and Manufacturing: Post-industrial Myth or Economic Reality? *Review of Policy Research*, 26, 2009, pp.35–54.
- [29] Bailey, D., Pitelis, C. & Tomlinson, P., *A Place-Based Developmental Regional Industrial Strategy for Sustainable Capture of Co-created Value*, *Cambridge Journal of Economics*, 42(6), 2018, pp.1521-1542.
- [30] Wade, R., From global imbalances to global re-organisations, *Cambridge Journal of Economics*, 33, 2009, pp.539-562.
- [31] Angelov P., Rosenkranz, R. & Schenk, H., *Competitive effects of merger remedies in Europe's high-tech industry*, Utrecht School of Economics, Utrecht University, Discussion Paper Series 12-16, 2012.



- [32] Andreoni, A. & Chang, H., Bringing production and employment back into development; Alice Amsden's legacy for a new developmentalist agenda, *Cambridge Journal of Regions, Economy and Society*, 10, 2016, pp.173-187.
- [33] Mazzucato, M., Mission-oriented Innovation Policy: Challenges and Opportunities, UCL Institute for Innovation and Public Purpose (IIPP) Working Paper Series, (IIPP 2017-01), 2017, <https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/moip-challenges-and-opportunities-working-paper-2017-1.pdf>
- [34] Andrews, D, Criscuolo, C. & Gal. P., The Global Productivity Slowdown, Technology Divergence and Public Policy: A Firm Level Perspective. Working Paper 24. Washington: Brookings Institution Hutchins Center, 2016.
- [35] European Commission, European Innovation Scoreboard 2018: Europe Must Deepen Its Innovation Edge. Brussels: European Commission, 2018, [https://ec.europa.eu/growth/content/europeaninnovation-scoreboard-2018-europe-must-deepen-its-innovation-edge\\_en](https://ec.europa.eu/growth/content/europeaninnovation-scoreboard-2018-europe-must-deepen-its-innovation-edge_en).
- [36] Mazzucato, M., Mission-Oriented Research & Innovation in the European Union: A Problem-Solving Approach to Fuel Innovation-Led Growth. Luxembourg: Publications Office of the European Union, 2018.
- [37] Statistical Yearbook of Serbia, Statistical office of the Republic of Serbia, 2019.
- [38] Ministry of Finance of RS, Current Economic Trends, December 2018.
- [39] Strategija i politika razvoja industrije Republike Srbije od 2011. do 2020., Sl. glasnik, 55/2011.
- [40] Akcioni plan za sprovođenje Strategije i politike razvoja industrije Republike Srbije od 2011. do 2020., Sl. glasnik RS, br. 100/2011 i 61/2013.
- [41] Post-krizni model ekonomskog rasta i razvoja Srbije od 2011-2020., Vlada RS, 2010.
- [42] SEE 2020 Strategy of South- Eastern Europe 2020, 2014.
- [43] Serbia's New Growth Agenda, World Bank, 2019.  
<https://www.worldbank.org/en/country/serbia/publication/serbia-new-growth-agenda-background-papers>
- [44] Katić, N., Da li je zlatno doba ipak moguće, *Politika*, 3.02.2020.
- [45] Strategija industrijske politike Srbije 2021-2030, Ministarstvo privrede RS, 2019.
- [46] Nacrt Strategije pametne specijalizacije Srbije/S3 Srbije, 2019.
- [47] Savić, Lj., Srpska industrija za dvadeset prvi vek, *Industrija*, 1, 2009, pp.1-17.
- [48] Mičić, V.& Zeremski, A., Deindustrijalizacija i reindustrijalizacija privrede Srbije, *Industrija*, 39,2011, 2, pp.51-69.
- [49] Zeković, S., Perspektive i politike prostorne alokacije industrije u Srbiji, u *Značaj novijih Evropskih dokumenata za obnavljanje strateškog mišljenja i upravljanja u Srbiji* (ur. M. Filipović, M. Vujošević), Beograd, Ekonomski fakultet, Beograd, IAUS, 2010, pp.105-126.
- [50] Zeković, S., The new industrial policy of Serbia and possible consequences on urban development, in *The e-future of cities- between temptations of exponential technology growth and concept of the human city* (Ed. B. Stojkov), Book of proceedings, AINS, Faculty of Geography, Belgrade, 2019, pp.301.
- [51] Zeković, S., Tehnički progres i regionalni razvoj industrije u Srbiji, *Posebna izdanja 32*, Beograd, IAUS, 1997.